February 2017

# NSSC This Month

U.S. Army Garrison Natick Public Affairs Office


## Chief Among Them

### Milley comes to Natick

2013 and 2015 U.S. Army
Maj. Gen. Keith L. Ware Awards
First Place, Digital Publication

NAGC 2016 National Association of
Government Communicators
First Place, External Newsletter

# Commander's Corner

Brig. Gen. Anthony W. Potts
*NSSC Senior Commander*

## Sharing a Few Thoughts

The busy start to the year hasn't slowed down any, even after we were hit by a couple snow storms and had to close the installation twice in February.

We had a great visit from Gen. Mark Milley, the Chief of Staff of the Army. The chief saw what we are doing that impacts our Soldiers today and what we will do in the future. Thanks to everyone who played a role in making sure that the visit from Gen. Milley was a complete success.

As I am getting settled into my position as the senior commander, it is nice to get out of the office and learn about the great work that is done here at Natick on behalf of our Soldiers. It takes a complete team to accomplish our mission.

I enjoyed meeting the team at the Network Enterprise Center who keep us connected with the rest of the world. They were awarded the maximum accreditation that can be achieved for a network. Outstanding job!

Coming from Redstone Arsenal, where it might snow once every couple years, to the snow storms we had the past couple weeks, it definitely was a culture shock. I want to commend the great work that was done to open up the installation by the snow removal crew and also the great work to keep everyone informed on the status of the installation.

In my role as the deputy commanding general of the U.S. Army Research, Development, and Engineering Command, I visited our RDECOM Atlantic Team and received updates from our science advisers and International Technology Center Northern Europe.

I want to thank Natick Police Chief James Hicks for speaking at our African-American/Black History Month program. The chief is a great partner, and we at the Natick Soldier Systems Center are very fortunate to have the great relationship with the Town of Natick and their community leaders.

The garrison staff is working to put together a special event for NSSC at Fenway Park. Stay tuned.

March Madness is coming up, and I would be wrong if I didn't close out with GO CATS (the Kentucky Wildcat type)!

Brig. Gen. Anthony W. Potts
NSSC Senior Commander


**NSSC This Month**

**NSSC**
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Garrison Commander
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Command Sgt. Maj.
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**About this newsletter**
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To subscribe to *NSSC This Month*, please contact Bob Reinert at robert.j.reinert.civ@mail.mil.

On the Web: www.army.mil/natick

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*Photo: Jeff Sisto, NSRDEC Public Affairs*

# NSSC News Briefs ...

## GEMS Program

Applications for GEMS students will open March 1. The information on the camps and the application link can be found at http://www.usaeop.com/Natick/. The camps are each four days in duration and will run from 8:15 a.m. to 3:30 p.m. There will be two camps for each GEMS level. The grade levels for the camps are based on the fall 2017 grade level for the student. GEMS I is intended for 5th-6th graders, GEMS II is intended for 6th-7th graders, and GEMS III is intended for 7th-9th graders. Notifications for acceptance into the camps should be made by April 21. The dates for the camps are as follows:

- GEMS I: July 10-13 or July 17-20
- GEMS II: July 24-27 or July 31-Aug. 3
- GEMS III: Aug. 7-10 or Aug. 14-17

If you have any questions about the program, please direct them to usarmy.natick.medcom-usariem.mbx.usariem-gems@mail.mil.

## Financial Readiness Courses

A series of five online training courses about money management is available covering the topics of consumer credit, developing your spending plan, and more. Visit the Military OneSource My Training Hub today at https://myhub.militaryonesource.mil/.

## MWR Closure

The Lord Community Activities Center (Bldg. 32) will be undergoing scheduled renovation work this spring and is expected to be closed from May 1 through July 4. For more information, please contact MWR at ext. 4791.

## Free Tax Service

Active Duty, reserve and retired military members of any service and their eligible dependents may receive tax preparation assistance at no cost, pending availability of volunteers. The Tax Center is operated at Hanscom Air Force Base and will accept clients by appointment only. To make an appointment, e-mail 66ABG.JA.TaxCenterSchedule@us.af.mil.

## Home Base Adventure Series

Join other veterans and military families for free activities and seasonal sports. Home Base collaborates with businesses and nonprofit community organizations throughout New England who host the Adventure Series activities. Past activities have included: skiing, skating, museum visits, sailing, attending baseball games, and more. Sign up for more information through the Home Base website http://homebase.org/adventureseries.

## Garrison Spotlight

### Bruce Coffin

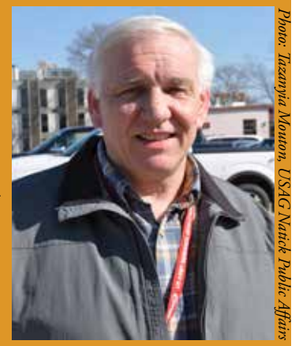


Photo: Tazanyia Mouton, USAG Natick Public Affairs

**What Bruce does:**

Bruce is the mechanical engineering technician overseeing projects, as well as maintenance service contracts, for the Operations and Maintenance Division of Public Works.

**DPW Acting Director Rob Mackson on Bruce:**

"Bruce works tirelessly behind the scenes ensuring the base has the proper support to remain operational. Annual contractual responsibilities are valued over $1 million. His contract responsibilities include snow removal, elevator maintenance and service, plumbing maintenance and service, and portable sanitary facilities. In addition, he processes service and maintenance order contracts as assigned, providing specifications, sketches, and COR administrative requirements for functional repairs and construction on the installation. Bruce is responsible for creating the required acquisition documents, including Statements of Work, Acquisition Strategies, Independent Government Estimates, Management Oversight of Acquisition Services, Quality Assurance Surveillance Plans, and Secretary of the Army Approvals. Bruce also operates Wide Area Workflow and GFEBS, where he creates needed purchase requisitions. Bruce's dedication to detail and contractor accountability has contributed immensely to the success of the Operations and Maintenance Division of the Directorate of Public Works and the U.S. Army Garrison Natick."

## Join the CWF

The Civilian Welfare Fund is a group of volunteers from across the installation who meet on the first Wednesday of each month to plan and execute various activities on and off the installation for our NSSC workforce. We are currently looking for new members to be a part of our great organization. If you are curious about everything we do, and want more information, please join us for an informational meeting on March 8, from 1:30-3 p.m., in Bldg. 3, room R-301. For more information, e-mail Duane Young at duane.l.young.civ@mail.mil.



# AER Kickoff

**Natick Army Emergency Relief**

For 75 years, Army Emergency Relief has faithfully helped the Army take care of its own by providing approximately $1.8 billion in interest-free loans and grants to Soldiers, retirees and their families facing financial difficulty. Army Emergency Relief also provides education scholarships, assisting more than a dozen Natick Solider Systems Center families in the past two years alone.

"AER is about the military helping its own, which includes Department of Defense civilians or contractors who may wish to contribute funds to help Soldiers or retirees in need. It is a community effort," said Diane Magrane, Natick AER officer. "The more we educate the community, the more they will know about resources available through the AER and how they can help."

The AER fundraising campaign runs March 1 through May 15 and this year's kickoff will be held March 17 at 11:30 a.m. at the Lord Community Center. The event features a chili and "chowda" contest, which is part of the ongoing Commander's Cup Challenge. There will be meat and meatless categories, with the grand prize awarded to the overall champion. Individual or unit/directorate entries are welcome.

"We invite all of NSSC to join us on St. Patty's Day for our kickoff event," said Magrane. "You can enter your favorite recipe, try some great chili and chowder, and support a cause that is close to heart for so many here at Natick."

For more information about the cook-off, e-mail Bert Scott at bert.r.scott4.naf@mail.mil, by March 10. For more information about AER or how to contribute, contact an AER representative:

For USARIEM – Maj. Amy Carlson at amy.m.carlson6.mil@mail.mil, 1st Lt. Robert Hugenberger at robert.s.hugenberger.mil@mail.mil, Staff Sgt. Karla Lopez at karla.v.lopez4.mil@mail.mil, or Sgt. Charina Hocog at charina.b.hocog.mil@mail.mil

For HRDD and all other units – Sgt. Vanessa Alvarado at vanessa.alvarado.mil@mail.mil

For civilians and general information – Diane Magrane at diane.k.magrane.civ@mail.mil

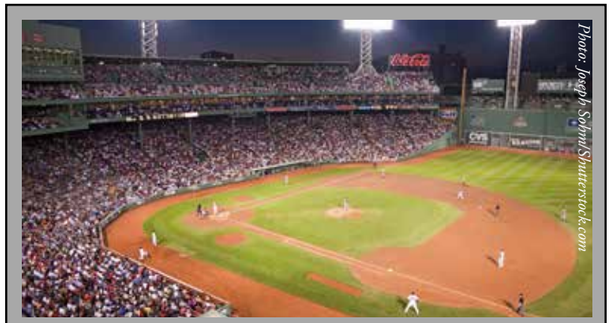


Photo: Joseph Sohm/Shutterstock.com

## Natick Night at Fenway

Team Natick night at Fenway Park is June 9. The Red Sox take on Detroit and we have 40 tickets available for the game. You can register for an opportunity to purchase a ticket to the game by clicking here. The drawing will take place during the Red Sox Opening Day party at the Lord Community Center, April 3 from noon until 5 p.m.

## Focal Point

Photo: David Kamm, NSRDEC SimComm

*Army Chief of Staff Gen. Mark A. Milley examines helmet technology during his visit to the Natick Soldier Systems Center, Feb. 24. See story, page 8.*

# Town of Natick police chief speaks at NSSC

## Hicks is guest at African-American History observance

**ByTazanyia Mouton, USAG Natick Public Affairs/NATICK, Mass. (Feb. 15, 2017)**

Chief James Hicks, the Town of Natick's police chief, spoke to the Natick Soldier Systems Center workforce during the Black History Month observance, Feb. 8.

*Chief Hicks*

This year's Defense Equal Opportunity Management Institute theme for Black History Month is, "Success Always Leaves Footprints."

"This year's theme is profound because every state in this great country was touched in some way by the offensive hand of slavery," said Donna Leon, Black Employment Program Committee member. "From the poor cities where Africans disembarked from the slave ships, to the battlefields where their descendants fought vehemently for freedom; from the colleges and universities where they pursued education, to the areas where they created communities during centuries of migration, the imprint of Americans of African descent is deeply embedded in the narrative of the American past.

"One cannot tell the story of America without preserving or reflecting on the places where African-Americans have made history."

The program allowed Natick's personnel to remember and learn about the people and places that, over time, have left footprints in our history.

Hicks was born in Brooklyn, New York, where he received his early education. He relocated to Massachusetts in 1975 to attend the Groton School, and later continued his education at Brandeis University in Waltham, Massachusetts.

Throughout his career, Hicks has served on several committees and working groups throughout the Commonwealth, such as the Massachusetts Chiefs of Police Civil Service and Finance Committee and the Legislative Special Commission on Massachusetts Police Training.

"It is an honor to be here to speak in front of a group such as this," said Hicks. "When I was first approached to speak today, I was given some choices. Obviously, looking at the theme, 'Success Always Leaves Footprints,' I had an opportunity to choose to talk about success or talk about education, and specifically the crisis of African-American education today."

Hicks said when he was younger and looked at his friends who went to public school, it appeared that the schools at that time did not push or emphasize what education meant.

"I'd be the first one to tell you that I'd rather be out with my friends doing certain things they were doing than to go to school," said Hicks. "But our parents kept us in touch and kept us focused."

Hicks said that even while attending the Groton School, he struggled with what being successful actually meant.

"At Brandeis, I got to learn and understand the value of an education and that came to me slightly when I started to get involved with the community," said Hicks.

After graduating from Brandeis, Hicks began his law enforcement career with the university as a member of the campus police department. He then worked for the Massachusetts Institute of Technology Police Department, and later joined the Waltham Police Department.

"Early in my police career, I had an opportunity to work with communications in the African- American and Latino community, and I tried to understand where we lose this connection about the importance of education," said Hicks.

Hicks said that higher education now will be necessary to be successful in every field because technology is moving to the forefront.

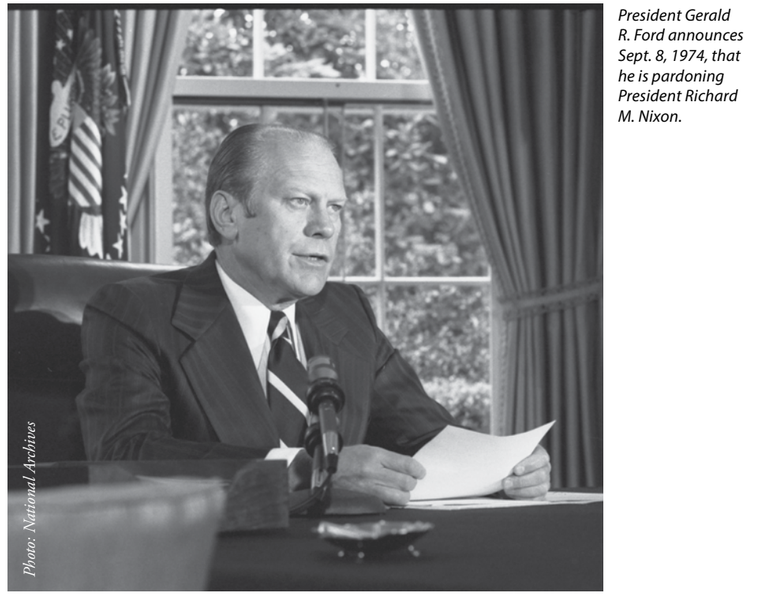
"So we need to understand, from the very beginning, where these job opportunities are in order to be successful," said Hicks. "They're shrinking (and) requiring more skills."

Hicks said most importantly, there needs to be an understanding that the education crisis, which has existed over many years, has gotten worse.

"We as leaders in our communities; we as leaders as parents; we as leaders as educators; we as leaders as teachers – we need to step up and understand and tell our students why (education) is important and what success means," said Hicks. "The opportunities are out there, but what concerns me is that we're not taking advantage of it."



Legal Corner



*President Gerald R. Ford announces Sept. 8, 1974, that he is pardoning President Richard M. Nixon.*

*Photo: National Archives*

# Pardon me ...

## Not uncommon for presidents to grant reprieves

**By Capt. Briana S. Tellado, Command Judge Advocate**

Article II, Section 2 of the U.S. Constitution states that the President of the United States "shall have power to grant reprieves and pardons for offenses against the United States, except in cases of impeachment."

Today, the president's options for granting executive clemency include commutations and pardons. A commutation reduces a convict's sentence, which usually means the person spends less time in jail, but could also mean that someone sentenced to death will instead spend life in jail. A pardon, on the other hand, is usually only granted at least five years after the person has finished serving the sentence for his most recent criminal conviction. Unlike a commutation, a pardon restores civil rights that are lost after federal conviction, such as the right to vote, hold office, serve on a jury, or possess a firearm. A pardon does not equate to a ruling of innocence, but is an act of forgiveness by the president. Because a court-martial is a federal trial, a person convicted at one is eligible to apply for a pardon or commutation.

President Washington was the first to exercise the executive clemency power when he pardoned the two leaders of the Whiskey Rebellion, who had been convicted of treason. President Andrew Johnson pardoned the Confederate Soldiers after the end of the Civil War. Presidents Truman and Carter both pardoned countless men who were convicted of dodging the draft during World War II and Vietnam.

Just a month into his presidency, President Ford granted his predecessor, President Nixon, a "full, free, and absolute pardon" for his involvement in the Watergate scandal. Ford decided that a criminal trial of Nixon would cause a "prolonged and divisive debate" throughout the country. As Ford explained years later, "I finally decided that I should spend all my time on the problems of all Americans and not 25percent of my time on the problems of one man."

While opinions differ whether Ford made the right decision, almost everyone agrees that by granting Nixon a pardon, Ford lost any chance he had for re-election.

In December 1992, President George H. W. Bush issued a presidential proclamation pardoning six participants in the Iran-Contra affair. Bush believed the individuals were convicted because of their political beliefs and disagreement with political policy. He also pardoned a few more draft-dodgers convicted in the 1940's and 1950's.
In January 1997, President Clinton pardoned Raymond Phillip Weaver, a Sailor convicted at a summary court-martial in 1947 for stealing four pounds of butter. But this pardon wasn't newsworthy.

When President Clinton pardoned his half-brother, Roger Clinton, it was a different story. Roger Clinton was convicted in 1985 of conspiring to distribute, and distributing, cocaine. Anticipating a negative reaction from the public, many presidents hold off on granting clemency on controversial cases until their last few days in office. President Clinton was no different, except a month after he left office, he wrote an editorial to the New York Times explaining his decisions. He said the principal motivator in granting the pardons was a desire to restore the civil rights of individuals who had already served their sentences.

The overwhelming majority of pardons and commutations issued in the last decade were for drug offenses and financial crimes, not acts of personal violence. Perhaps the most famous grant of clemency during President Obama's term was that of Army Private (PVT) Chelsea Manning. In 2013, Manning was convicted at a court-martial for providing classified documents to the website WikiLeaks. She was sentenced to 35 years of confinement. During one of his last days in office, President Obama commuted her sentence to end in May 2017.

While grants of executive clemency are often unpopular, they are anything but unusual.


Photo: Jeff Sisto, NSRDEC Public Affairs

> "You guys are doing great work, and I personally appreciate it."
>
> Army Chief of Staff Gen. Mark A. Milley

# Chief Among Them

## Milley comes to Natick

**By Bob Reinert, USAG Natick Public Affairs/NATICK, Mass. (Feb. 24, 2017)**

When Army Chief of Staff Gen. Mark A. Milley came Feb. 24 to check in on the latest technology being developed at the Natick Soldier Systems Center, he no doubt felt right at home.

Milley, the 39th CSA, was about 25 miles from his native Winchester, Massachusetts, and even closer to the Belmont Hill School, where he played ice hockey and football before leaving his home state in 1976 to skate and study at Princeton University. He graduated from Princeton and received his commission in 1980.

Milley was welcomed to Natick by Maj. Gen. Cedric Wins, commanding general of the U.S. Army Research, Development and Engineering Command; Brig. Gen. Anthony W. Potts, senior commander, Natick Soldier Systems Center; and Douglas Tamilio, director, Natick Soldier Research, Development and Engineering Center.

"It's a highly skilled workforce," said Wins in his introductory comments about Natick. "It's also a workforce we have to compete for."

The visit was meant to align Natick with Milley's vision, show the unique value of Army science and technology, and explain the Army's partnerships and alliances in the New England region.

During the visit, Milley heard about performance nutrition, assured re-supply, Soldier and squad performance optimization, individual Soldier protection, Soldier systems integration, camouflage and signature management, expeditionary maneuver support, individual Soldier power and energy, and individual water purification. As he moved from station to station, he offered comments to the briefers.

"I want the most advanced … stuff, but I'm not wasting money," Milley said. "I've got to retool the Army to fight the next war, not the last one.

"Keep it light. Keep it simple. Think logically."

At the end of his tour, Milley thanked the assembled Soldiers and civilians for their work at Natick.

"You guys are doing great work, and I personally appreciate it," Milley said. "It's very, very important, what you're doing. Everything we wear and touch and that which is actually most important to the individual Soldiers is stuff that comes from Natick, and that's been like that for many, many years.

"I personally appreciate it on behalf of 1.1 million Soldiers out there; but beyond Soldiers, you're outfitting Marines, you're outfitting the Navy, you're outfitting the Air Force, you're outfitting the Coast Guard, and, in fact, you're outfitting many, many foreign armies, as well. Keep driving on."

Photo: David Kamm, NSRDEC StratComm

*Army Chief of Staff Gen. Mark A. Milley examines body armor during his Feb. 24 visit to the Natick Soldier Systems Center.*

Milley pointed out that he had a personal stake in what happens at Natick because of his long background as a dismounted infantry Soldier who trained and fought in what's made here. He also told Natick workers that he appreciates how they network with the force and other researchers inside and outside of the Army.

"You probably don't realize the full extent, the bow wave, the sort of second and third order effects of what you do up here," Milley said. "It might not strike home every day … and you might not fully comprehend the impact of (this) little niche pocket of innovations that is punching way above its weight – all around the world, actually."

# ‘Right Soldier in the Right Job’

## The science behind the OPAT

By Mallory Roussel, USARIEM Public Affairs/NATICK, Mass. (Feb. 22, 2017)

Mention the Occupational Physical Assessment Test, or OPAT, to Soldiers, and most will know about the battery of four physical performance tests that, starting in 2017, the Army administers to all recruits to assess their physical performance capabilities to determine if they should be allowed to join the Army.

The implementation of the OPAT is a major change in how the Army will assess potential recruits. It will identify individuals who have the capabilities to perform some of the Army’s most physically demanding military occupational specialties, or MOS’s, such as those in the Combat Arms, as well as individuals who are not yet physically prepared to start training.

What the world did not know about was the science and effort involved in developing the OPAT.

During an award ceremony on Jan. 20 in Fort Eustis, Virginia, at the U.S. Army Center for Initial Military Training, or CIMT, Maj. Gen. Anthony Funkhouser, commanding general of CIMT, recognized researchers from the U.S. Army Research Institute of Environmental Medicine, or USARIEM, for their contributions to the OPAT. CIMT is part of Training and Doctrine Command, or TRADOC.

Marilyn Sharp, a research health exercise scientist and the principal investigator of the OPAT study, was awarded the Commander’s Award for Civilian Service. Dr. Jan Redmond and Dr. Stephen Foulis, both research physiologists and associate investigators on the study, each received the Achievement Medal for Civilian Service.

“The purpose of the OPAT is for a recruiter to test a Soldier easily and quickly to determine whether they are physically ready to be trained for a MOS,” said Sharp, of USARIEM’s Military Performance Division, or MPD. “What USARIEM researchers did was get it down to the essential physical capabilities that a Soldier needs to be trainable for a given MOS.”

Back in 2013, USARIEM researchers began working with TRADOC in a three-year research effort known as the Physical Demands Study. USARIEM researchers traveled thousands of miles to different Army bases, spoke with hundreds of Soldiers at all levels, collected physiological performance data and conducted several stages of testing with the goal of developing the physical tasks in what recruits know today as the OPAT: the standing long jump, seated power throw, strength deadlift and interval aerobic run.

The effort was part of the comprehensive TRADOC “Soldier 2020” initiative, which would help set the standards necessary for Soldiers--male and female--to perform combat MOS’s, including those in armor, infantry, field artillery and combat engineering. The goal of Soldier 2020 was to better match an individual’s physical capabilities to the requirements of a specific MOS.

“TRADOC wanted a physical test, or a battery of tests, to accurately assess a recruit’s physical potential to perform physically demanding military tasks,” Sharp said. “By using this predictive test, they would be able to assign the right Soldier to the right job.”

The first step in developing the OPAT was to identify the physically demanding tasks of the Combat Arms MOS’s. The OPAT tasks were developed from an analysis of 32 physically demanding tasks that Soldiers must perform.

Where did these initial 32 tasks originate?

“TRADOC consulted with senior subject matter experts from the Army Branch Offices for infantry, field artillery, armor and combat engineering to compile a list of the critical physically demanding tasks each performed,” Sharp said. “Some of the tasks were common to several MOS’s, while others were specific to an MOS. The list was socialized among leaders in the deployed force.”

TRADOC conducted a field training exercise to verify the accuracy of the tasks, conditions and standards across the operational force by having more than 500 Soldiers from eight brigades – heavy and light units – throughout five installations perform the 32 tasks. For a successful verification, 90 percent of the Soldiers should be able to complete the tasks to standard. TRADOC subject matter experts examined the data and revised the task standards if needed. While TRADOC conducted the field training exercise, USARIEM researchers were able to observe the Soldiers in action.

“We were able to observe the Soldiers performing these tasks and learned a lot about how tasks were performed, what equipment Soldiers needed and how long tasks typically took,” Sharp said. “Some task standards and conditions had to be re-examined because more than 10 percent of the Soldiers could not perform them to standard.”

That was when TRADOC gave USARIEM the green light to administer the first phase of the Physical Demands Study. They conducted face-to-face focus group interviews with junior and senior enlisted Soldiers to learn how accurately these 32 tasks matched what Soldiers did in the field.

Then the researchers dug a little deeper. From Fort Hood, to Fort Bliss, to Fort Stewart and more, USARIEM researchers traveled to different Army posts for about a year to test male and female Soldiers performing the 32 tasks. Sharp and her team wanted to gather physiological data.

“We wanted to see how difficult these tasks really were,” Sharp said. “Along with asking volunteers how hard they found the tasks and observing how many volunteers were able to complete them, we measured their time to completion, energy cost, heart rate, respiration and oxygen consumption.”

The researchers used the physiological data to narrow down the 32-item list to the eight most physically demanding tasks. After gaining consensus on the eight tasks from the Army Branch Offices, USARIEM researchers developed task simulations to assess the unique physical requirements of each task.

“The task simulations were simplified versions of the critically physically demanding tasks,” Sharp said. “They were modified to allow the tasks to be performed individually, provide a range of physical scores instead of just a pass-fail rate and ensure reproducible and reliable results.”

From 2014 to 2015, 877 fully trained active-duty men and women completed both the task simulations and a series of simple predictor tests, which to civilians, look similar to fitness tests performed in gym class.

The goal was to determine which predictor tests successfully predicted performance on the task simulations. When USARIEM presented their findings to TRADOC, the researchers had distilled the criteria to the four OPAT tasks. According to Sharp, these tasks were shown to be statistically significant in predicting Soldier task performance while remaining gender, age and body-size neutral.

USARIEM was then tasked by TRADOC’s CIMT in November 2015 to establish the validity of using the OPAT to test new, untrained recruits. Redmond, also from MPD, indicated that the testing of recruits went extremely well, largely due to the experience the research team had acquired during the OPAT testing of active-duty Soldiers.

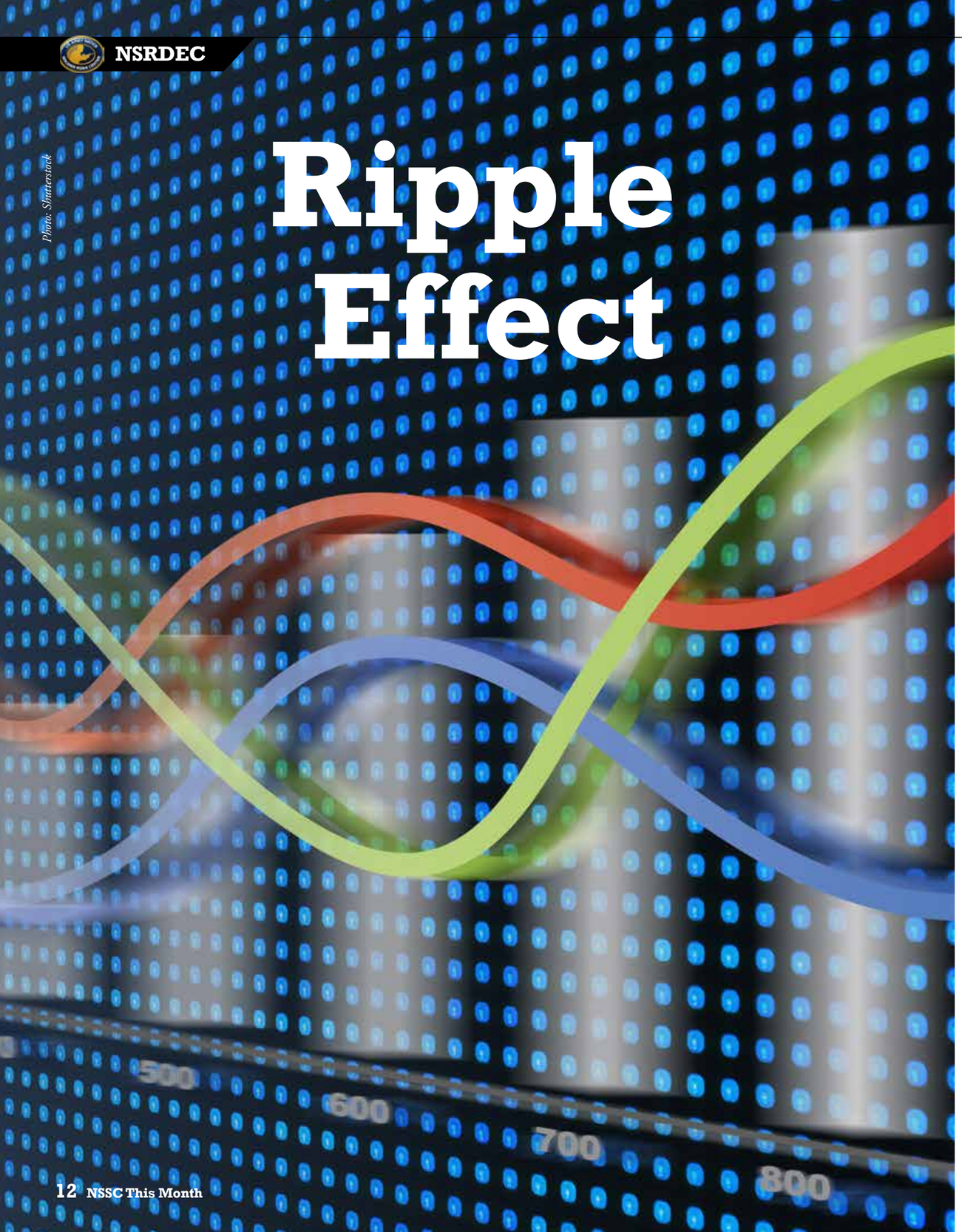
“By the time we got to the OPAT, we learned a tremendous amount about how to make the testing procedures go quickly and smoothly,” Redmond said. “During the task simulations, for example, rather than asking a Soldier to build a bunker, we determined that the action of lifting and carrying sandbags was more physically demanding than filling the bags with sand. For the task simulation, Soldiers carried prefilled sandbags a specified distance.”

The research effort to validate the use of the OPAT over a period of time concluded in December 2016. About 100,000 recruits and thousands of cadets will take the OPAT starting this year, yet the research is never over. USARIEM will follow the volunteers during the first two years of their service to see if they are successful in their assigned MOS’s after receiving OPAT results, or if they change their MOS’s or leave the Army. TRADOC’s CIMT will conduct surveillance continuously to see how accurately the OPAT assesses physical requirements for MOS’s.

Developing the OPAT is regarded as a major achievement for the USARIEM researchers, and according to Sharp, it will help shape the future U.S. Army.

“The goal of the OPAT is to put the right Soldier in the right job,” Sharp said. “Soldiers who pass the OPAT for their MOS should be trainable to be successful. One of the unintended benefits of the OPAT is that the Army may see a reduction in musculoskeletal injury and attrition rates during basic training, which would optimize Soldier readiness.”

Photo: Tech Sgt. Barry Loo, U.S. Air Force






# Helping the Soldier also benefits local economy

**By Jane Benson, NSRDEC Public Affairs/NATICK, Mass. (Feb. 28, 2017)**

In addition to providing cutting-edge technologies to our nation's warfighters, the Natick Soldier Research, Development and Engineering Center also boosts the nation's economy by using license agreements to facilitate commercial access to these technologies. NSRDEC develops food, clothing and protective technologies for the nation's warfighters and is also the home of innovators making precision aerial resupply possible.

TechLink, a Department of Defense-funded technology transfer center at Montana State University, conducted an economic impact study in collaboration with the Business Research Division of the Leeds School of Business at the University of Colorado Boulder. The resulting report, entitled *National Economic Impacts from DoD License Agreements 2000-2014*, reveals the economic contribution made by DoD entities, including NSRDEC, through technology licensing.

According to the report, U.S. government agencies have a federal legislative mandate to transfer their inventions to the private sector whenever possible in order to benefit the public and the nation's economy. Patent license agreements are used to transfer these inventions to industry and enable private industry to develop and sell new products and services using these inventions.

"What we studied was just a small part of the total impact of NSRDEC on the local economy," said Dr. Will Swearingen, CLP (Certified Licensing Professional), executive director of TechLink. "The study looked at the outcomes and impacts of the license agreements for the patented inventions at NSRDEC that were successfully converted into (commercially available) products."

The researchers contacted all of the companies with the license agreements and asked them about their sales of new products licensed from NSRDEC or derived from licensed technologies. The total sales of patented inventions that were the subject of NSRDEC license agreements active during the 2000-2014 period amounted to nearly $1 billion ($971 million).

"With the economic multipliers, the total economic impact from those license agreements was around $2.8 billion, which supported around 15,300 jobs with an average wage of $54,000," said Swearingen.

"We're here because our mission is to help the warfighter," said Jeff DiTullio, Business Development team lead at NSRDEC. "We do that not just through R&D collaborations but also through licensing. Licensing puts technologies into the hands of commercial entities that can then go out and provide the public the benefit of DoD research and development by providing a product. It also provides opportunities for DoD to procure these products as Commercial Off-The-Shelf (COTS) items, which is normally faster and less expensive than other means of procurement."

"NSRDEC's location in New England allows for numerous critical technology producing opportunities with academia and industry," said Douglas Tamilio, director, NSRDEC. "These technologies, not only add capability to our nation's warfighters, but also have significant impact on the local economy."

In addition to helping the local economy, NSRDEC's research and development efforts with academia and private industry have led to groundbreaking developments in textiles, protective clothing, shelters, food, food packaging and food processing. These inventions have military applications but also have also benefited emergency responders, NASA astronauts and the average consumer.

One recent NSRDEC success story is the Ballistic Combat Shirt. NSRDEC developed the protective clothing item with Protective Force LLC. NSRDEC also worked with the U.S. Army Research Institute of Environmental Medicine at Natick to ensure that warfighters wouldn't become too hot while wearing the shirt. Protective Force has already commercialized the product so it can be sold to law enforcement.

"The partnerships benefit the warfighter in a couple of different ways," said DiTullio. "When we have an R&D partnership, those relationships allow us to leverage our capabilities in ways that actually create a force multiplier by partnering with a company that shares common objectives and where we can meet those objectives better, cheaper, faster by working together than by working alone."

"In terms of the public value of Natick R&D, I think you can say that Natick is a national engine of innovation, and that its innovations and inventions not only support the U.S. military but have also contributed to the advancement of entire industries, such as food processing," said Swearingen.

"In any case where it is a dual-use technology where the government might license the technology for commercial use but also procure it for government purposes, those commercial sales and economies of scale help bring down the cost of the government purchases," said DiTullio. "The instances that are really rewarding are when we can take a technology and put it into the hands of a commercial entity, see them make a product that consumers can buy, that the government can also procure for the benefit of Soldiers."

# Chill Out

## Alaska's extreme cold tests Soldiers, equipment

**By David Vergun, Army News Service/LACK RAPIDS TRAINING SITE, Alaska (Feb. 21, 2017)**

Newcomers to the interior of Alaska are often taken aback by the extreme winter cold and its effects on the body and equipment, according to Steve Decker, a training specialist at the Northern Warfare Training Center.

When it gets 50 or 60 degrees below zero, vehicles – even tracked ones designed for the cold – quit working, Decker said. Those temperatures are not uncommon here, with minus 30 and minus 40 fairly normal for winter. It can get so cold that even engine oil and transmission fluid will freeze, rendering vehicles inoperable.

When vehicles aren't in use, they're kept plugged into outlets featured at every parking spot. The electricity powers heating pads and engine block heaters. Oil and transmission pans have silicone heating pads directly attached to them. Block heaters or freeze-plug heaters are heating elements that actually stick into the side of the engine.

Even with these precautions, everything seems to fail on the coldest days, and movement becomes possible only via skis and snowshoes. Getting around that way is taught to Soldiers attending the Cold Weather Leaders Course and other winter courses here, Decker said.

Today's Soldiers are dependent on vehicles and roads, Decker said. Out here and in many parts of the world, such dependence can limit options when vehicles don't work and roads are few or nonexistent. At NWTC, Soldiers are taught to rely less on machines and more on themselves, he said.

But it's not just vehicles that break down in the cold. Anything powered by batteries will also be prone to failure in deep-freeze conditions, Decker said. That includes GPS devices.

Soldiers have become too reliant on GPS, too, he said. As part of the CWLC, students are tasked with finding specific points throughout the rugged 16-square-kilometer training site using just their maps, protractors and compasses.

### LEARNING FROM OTHERS

When instructors aren't teaching students the art of surviving and operating in cold weather, they attend cold-weather training schools in other countries and bring back new ideas, Decker said.

For example, instructors have visited Nepal, which has some of the world's highest mountains. There, they learn the effects of high altitude and how it affects the mind and body, explained Staff Sgt. Jonathan Tanner, an instructor.

In turn, other allies and partner nations are learning from the U.S. Army, Tanner said. Not long ago, Soldiers in Nepal were using rope made of a material that was inferior and poorly braided. U.S. Soldiers pointed them to a better-quality rope that's less prone to failure.

Another example of equipment that varies between the U.S. and partner countries is the type of skis. Sgt. Derrick Bruner, an instructor, said the U.S. Army uses NATO skis, sometimes called White Rockets, while Soldiers in Norway use a type of ski called the Jager.

"In my opinion, the White Rocket is a better ski than the Jager," Bruner said. The ski bindings work well with the Vapor Barrier, or VB boots, that are issued to Soldiers in arctic areas.

However, the Army is currently using a number of Jager skis because some Soldiers with large feet cannot be fitted with VB boots. (The boots aren't available in very large sizes.) In that case, Soldiers are issued Canadian Mutluks, boots that can worn only with Jager skis, he said.

Spc. Elijah Mainini, a student, is one such Soldier who was issued Mutluks and Jager skis because his feet are too large for VB boots. He wears a size 16 boot.

Mutluks are much more comfortable to wear and walk in, and they provide better traction over icy terrain, Mainini said. The problem is that they aren't designed to be used with skis because they lack the necessary rigidity, particularly for ankle support.

Sgt. Eric Martin, a medic, said VB boots keep feet warm and dry, but they're so rigid that the tops of them often dig into Soldiers' calves and shins, causing skin abrasions. Mutluks, on the other hand, are flexible and don't dig into the skin.

Decker said there are pros and cons to nearly every piece of gear and clothing. The only sure way to know what works and what doesn't is through extensive testing. Currently, instructors are test-wearing a number of different styles of gloves and other garments.

Kate Young, a textile technologist from Natick Soldier Research, Development and Engineering Center, Natick, Massachusetts, was at NWTC collecting feedback on a variety of non-standard issue gloves the Soldiers were wearing.

In 2016, she had visited NWTC to collect feedback on the Generation III Extended Cold Weather Clothing System. ECWCS III features seven layers of insulated clothing that Soldiers at NWTC and in arctic regions are issued.

Natick is always looking for new ways to improve Soldiers' clothing, she said, and there's no better place for testing them than here in the extreme cold.

*(Follow David Vergun on Twitter: @vergunARNEWS)*



*Sgt. Eric Martin, a medic, shows what Canadian army-issued Mutluks look like. Opposite, Spc. Elijah Mainini, a student, is one of those people who can't fit into a VB boot and was issued Mutluks and Jager skis, shown here. He wears a size 16 boot.*

*Photos: David Vergun, Army News Service*

# AM

**Also known as 3-D printing, additive manufacturing allows the Army to make spare parts in the field for robotic vehicles, hand grenades ... even drones**

Photo: U.S. Army

*The 3-D printed On-Demand Small Unmanned Aircraft System, or ODSUAS, is a new concept where Soldiers add requirements to mission-planning software, and the system knows the optimal configuration for an aerial vehicle. It's printed and delivered within 24 hours.*

**By Argie R. Sanatinos Perrin, RDECOM/ ABERDEEN PROVING GROUND, Md. (Jan. 30, 2017)**

The Army is increasing its footprint in Additive Manufacturing, also referred to as 3-D printing, by printing spare parts for robotic ground vehicles, hand grenades and even drones. To tackle this rapidly evolving technology, the Army has developed an AM technology roadmap, which was merged into an overarching Department of Defense roadmap recently.

The DOD roadmap is comprised of common requirements and technical objectives identified in individual AM roadmaps from the Army, Navy, Air Force and Defense Logistics Agency. The DOD roadmap also identifies current and future capabilities that are needed to enable AM and areas for collaboration.

Manufacturing USA (National Additive Manufacturing Innovation Institute), which was established as part of a presidential initiative in 2012 to stimulate and accelerate AM in the United States, provided assistance in creating the roadmaps, using the same process, methodology and taxonomy from the National AM technology roadmap that it developed with its partners from industry and academia. The goal is to leverage the DOD AM technology roadmap as an overarching AM roadmap with common goals and objectives that will set the course for the DOD, industry and academia to effectively use AM.

"The Army relies on the manufacturing prowess of industry to keep our Soldiers the best-equipped in the world because having the best equipment, the right equipment in the right quantity when you need it is an essential component of making our Soldiers the safest and most effective in the world," said Maj. Gen. Cedric T. Wins, U.S. Army Research, Development and Engineering Command commanding general.

The Army plans to use AM to improve readiness by repairing or producing spare parts or by creating new parts in real-time as close to the point of need as possible. Using AM, parts can be produced in the field repeatedly without the need to retool, cast or mold. AM also eliminates the need to ship spare or new parts, which will save time and money.

In 2014, representatives from the Army, Navy, Air Force, DLA and the office of the Deputy Assistant Secretary of Defense for Manufacturing & Industrial Base Policy met with senior leaders at Manufacturing USA to discuss the DOD AM technology roadmap. The final roadmap was compiled from information gathered during workshops that representatives from the four services attended throughout the past year.

RDECOM organized an informal AM working group in 2013 to coordinate and plan AM activities across the Army enterprise. Since then the group has grown into a (chartered) Community of Practice, which was formalized in 2016. The RDECOM AM CoP serves as a central source for collaboration on the command's AM technology development activities, as well as a central location for mature AM technologies that are ready to support Army products. The CoP, which actively participated in developing the Army's AM technology roadmap, is currently identifying critical tasks and challenges for executing the roadmap.

The Army's roadmap was spearheaded by the Army Manufacturing Technology program, which is managed by RDECOM, a major subordinate command of the U.S. Army Materiel Command. ManTech engineers and researchers provide engineering support and work closely with Army organizations to identify and fund projects that support the overall Army science and technology strategy.

(For more information on Additive Manufacturing: https://www.army.mil/article/178822/)

# Bridging the Gap

## Physician assistant seeks to benefit future Soldiers

**By Army Medicine/NATICK, Mass. (Jan. 25, 2017)**

Even though Lt. Col. Amelia Duran-Stanton didn't start out with a clear picture of where she wanted to take her Army experience, she worked hard, learned from mentors and ended up shaping a career that she not only loves, but one that is helping future generations of Soldiers. In 2013, she was named one of the Global100 Most Influential Filipina Women in the World, and she wants little girls everywhere to know how much is possible in the U.S. Army.

**Enlisting at seventeen for a better future**

Duran-Stanton was born in the Philippines and moved to the U.S. with her family at age 11 to pursue educational opportunities and a better future. While her parents pursued graduate degrees, money was tight and she and her sister had to find a way to pay for college on their own.

In her senior year, she and her sister met with military recruiters at their high school. They were intrigued by the Army's offer to serve their adopted country, pay for their education and health care as well as the opportunities to travel. Duran-Stanton enlisted in the early-entry program during high school, and then attended basic training the summer after graduation. She was not afraid of hard work, because her parents had always held her to a high standard. Her father had gone to military school, and his parenting style reflected a sense of discipline and high expectations.

"We had it hard growing up, so basic training did not seem any harder than what we had already done," said Duran-Stanton.

**Becoming a physician assistant and earning a doctorate … twice**

Her first military occupational specialty was patient administration. Her role was to conduct and supervise administrative duties at an Army medical treatment facility.

At Duran-Stanton's second duty station, Fort Carson, Colorado, many of the medics in her field unit were applying for the Interservice Physician Assistant Program, or IPAP. At the time, she was considering becoming a nurse, but her interest was piqued and she met with some PAs to get more information. Even though many of her peers told her that it was hard to get in, Duran-Stanton applied, was accepted into IPAP and earned a bachelor's degree in physician assistant studies. She was also commissioned as a second lieutenant upon graduation.

"Everyone was telling me that I wasn't qualified enough to get in. I'm so glad that I decided to apply anyway," said Duran-Stanton. "The answer is 'no' if you don't apply. Apply and give yourself a chance."

Now an officer, after graduation she deployed to Kosovo, Iraq and Afghanistan. She also completed two doctorates: a Ph.D. in postsecondary/adult education and later a doctor of science in clinical orthopaedics.

During her Afghanistan deployment with 10th Mountain Division, she filled in for male line unit physicians and physician assistants during their rest and recuperation leaves. On one particularly memorable day, an Afghan woman came with her husband to the forward operating base complaining of terrible stomach pains.

Due to the sensitivity of the complaint, cultural norms required that only a woman could examine the patient without a male present. As the only provider available, Duran-Stanton examined the woman. A male medic communicated Duran-Stanton's questions to the male translator, who then asked the husband questions.

They fashioned an exam room with a sheet in the middle to separate the medic, translator and husband from the exam. They learned that the woman had been experiencing stomach pain since she had given birth. Duran-Stanton soon diagnosed the cause of the pain: The woman was carrying twins, and the second baby was waiting to be born. She then delivered a healthy baby.

"It was an experience that really showed how prepared you need to be in the Army," said Duran-Stanton. "I was so happy I was able to help her."

Applying her Experience as a Liaison

Today, Duran-Stanton is the deputy chief of the Thermal and Mountain Medicine Division at the U.S. Army Research Institute for Environmental Medicine, whose primary mission is to optimize Soldier health and performance through medical research. The Thermal and Mountain Medicine Division conducts research in heat stress, cold stress, and high altitude and environmental pathophysiology in order to help sustain and enhance Soldiers' physical and cognitive performance, while minimizing potential medical problems associated with military operations in environmental extremes.

With her unique perspective, connections with Soldiers over the years, and enlisted experience, Duran-Stanton bridges the gap to inform research studies with her real-life knowledge of the needs of Soldiers, and she is a liaison between the lab and the field.

Duran-Stanton's current research with TMMD revolves around heat stroke and heat injury. In one study, she is co-investigating with a group of researchers whether prior infections and prior heat illness lead to heat stroke susceptibility.

**Every day offers a new challenge**

In addition to this research and leadership role at USARIEM, Duran-Stanton wears many other hats. She coordinates feedback from junior PAs and serves as the lead for "Communications & Marketing" and "Research & Development" for the Army PA consultant to The Surgeon General.

Duran-Stanton enjoys her leadership roles because they allow her to mentor junior researchers, officers and enlisted Soldiers. She seeks out Army physician assistants all over the world to mentor them in conducting and sharing medical research. For example, she just finished working with geographically dispersed junior PAs to conceptualize, propose, write and submit 10 abstracts to the American Academy of Physician Assistants Conference.

It's important to her to mentor junior Soldiers because she's had so many influential mentors in her own career.

"I absolutely love collaborating with junior Soldiers and PAs on projects," said Duran-Stanton. "It's fascinating to learn from one another and work toward solutions for Soldiers."

According to Duran-Stanton, working at USARIEM has been the highlight of her military career. It has given her the opportunity to integrate her skills and learn new ones from highly educated and trained civilian and military professionals.





Photo: David Kamm, NSRDEC StratComm

*Members of the 101st Airborne Division's 1st Brigade, shown here, were the first to test the new female body armor in 2012 in Afghanistan. Air Force medics recently tested the FIOTV and provided feedback to Natick Soldier Research, Development and Engineering Center.*

# NSRDEC takes FIOTV to Air Force

## Female medics provide feedback on body armor

**By Kim Bowden, 711th Human Performance Wing/WRIGHT-PATTERSON AFB, Ohio Mass. (Jan. 26, 2017)**

In the spring of 2016, several female medics assigned to the United States Air Force School of Aerospace Medicine, part of the Air Force Research Laboratory's 711th Human Performance Wing, returned from deployments. One of the first stops was the Wing's Human Systems Integration Directorate's Anthropometry Lab to see what could be done about the fit of their body armor.

The currently-issued Improved Outer Tactical Vest doesn't offer a female cut or size range and often leads to a poor fit for women. Over the course of a deployment, that poor fit can lead to discomfort, fatigue and even serious injury. The HSI Directorate reached out to the Army, the expert at armor research, development and procurement within the Department of Defense, and discovered they offer and issue a female pattern and size range of the IOTV — already on the CENTCOM approved list.

"We asked if we could try the Female IOTV and conduct a task analysis for both fit and features," said Brenda Crook, Aerospace Physiologist and Human Systems Integration Practitioner. "The Army was extremely supportive of working collaboratively."

The Army's Product Manager for soldier protective systems, to include body armor, told Crook they could loan the directorate sets of armor for the fit assessment and task analysis as well as to issue for deployment. All they asked in return was feedback on the fit, comfort and utility of the armor in theater, a major tenant of the Army's soldier product support strategy.

"The Natick Soldier, Research, Development and Engineering Center, who designed the FIOTV, sent a team to train us on how to properly fit the FIOTV and to help conduct the task analyses," Crook said. "With the help of female volunteers from USAFSAM and the 88th Air Base Wing Medical Group, we conducted a two-day 'obstacle-course'-type task analysis to mimic triage and treatment using patient simulators. Both the volunteers and the 'patients' were in full gear, just as they would be in a deployed environment."

Throughout the events, the directorate collected data on the fit and impact on task performance for female medics, a demographic which was lacking in the current Army FIOTV data.

"The response from our volunteers was overwhelmingly positive," Crook said. "So with their feedback and the data we gathered, we went to Air Force Materiel Command about making the FIOTV available. With only two measurements required for sizing, the fit benefits are tremendous — the protection of our Airmen is obviously most important. If we can improve the comfort and prevent injury, it's a real win."

AFMC agreed and has submitted a funding request to make FIOTV available for Air Force deployers.

"As many benefits as the FIOTV offers, there are still ways to make body armor even better," Crook explained. "The Army is working on a scalable system, where you can add or take away layers — and, therefore, weight — as the threat situation requires. They hope to make it available in a couple of years. Our own Air Force Research Laboratory is also looking at advances in materials, such as flexible, buoyant armor plates, that could save considerable weight and conform better to the body shape. For all of our deployers — female and male — there is better fit and more comfort on the horizon."

Crook said the directorate hopes to continue its collaboration across the Human Performance Wing and with the other services to capitalize on technology advancement as well as better understand and influence how those systems integrate with other mission gear and impact overall warfighter performance.

# Women's History Month

March 2017